

**REMARKS**

In the Office Action, claims 1-31 are pending; claims 18-31 are withdrawn from further consideration and claims 1-17 are rejected under 35 U.S.C. § 103(a) as being unpatentable over United States Patent No. 6,441,066 issued to Woodworth et al. ("Woodworth").

Applicants respectfully traverse the rejection of claims 1-17. There are three basic criteria that must be met to result a *prima facie* case of obviousness in United States patent law. First, there must be some suggestion or motivation, either in the references or in the knowledge generally available in the art, to modify the reference or to combine the reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art references must teach or suggest all of the claim limitations. See Manual of Patent Examining Procedure ("MPEP") § 2143. Applicants respectfully submit that a *prima facie* case of obviousness has not been reached by the combination of references cited in the Office Action, for at least the reasons that there is no suggestion or motivation to modify the reference or to combine the reference teachings and the prior art does not teach all of the claim limitations.

Woodworth describes a pigment dispersion comprising a pigment, an aqueous carrier selected from water and a mixture of water and at least one organic solvent. The pigment dispersion is prepared by a controlled radical polymerization of a radically polymerizable monomer in the presence of a polymeric initiator having at least one radically transferable atom or group. The polymeric initiator forms the polymeric backbone segment of the pigment dispersant and the monomer form the polymeric segment that are pendent to the polymeric backbone segment. The

pigment dispersant has comb-like architecture in which the polymeric backbone segment is hydrophilic and he at least a portion of each pendent polymeric segment is hydrophobic. Applicants respectfully submit that one skilled in the art would not be motivated to produce the claimed invention by the disclosure of Woodworth.

The claims of the subject application are directed to a controlled polymerization process for (co)polymerization of radically polymerizable ionic monomers, comprising initiating the polymerization of free radically (co)polymerizable ionic monomers in the presence of a system initially comprising a transition metal complex and an initiator comprising a radically transferable azide group. Applicants have found that a radically transferable azide group is much more stable than a radically transferable halide when polymerizing ionic monomers in bulk or in aqueous media. The radically transferable nature of the halide is interfered with by the presence of the ionic functionality.

There is no suggestion of the advantages of using a radically transferable azide group for the polymerization of ionic monomers in Woodworth. The pigment dispersant is a polymer comprising a hydrophilic backbone and hydrophobic branches. The polymeric initiator, that forms the backbone, is preferable prepared by a non-living or controlled polymerization process of *second monomers*. The teeth, or branches, are formed by *first monomers*. See Woodworth, column 9, lines 39-41. Woodworth does disclose that the radically transferable group on the polymeric initiator may be selected from cyano, cyanato, thiocyanato, azido, halide groups or combinations thereof, but also clearly states that preferably the radically transferable atom or group is a halide. See Woodworth, column 5, lines 17-28. There is no suggestion that the azide would be preferable in any situation. The disclosed processes for preparation of a polymeric initiator comprising a radically transferable

atom or group in Woodworth do not include a process for preparing a polymeric initiator comprising a radically transferable azide group. *See* Woodworth column 8, line 51 to column 9, lines 38. Even though, Woodworth discusses for more than a column on how to prepare polymeric initiators with radically polymerizable halide atoms. Even during the discussion of conducting the polymerization in an aqueous media, Woodworth does not discuss the advantages of a radically transferable azide groups. Let alone discussing the advantage of the combination of initiating the polymerization of free radically (co)polymerizable ionic monomers in the presence of a system initially comprising a transition metal complex and an initiator comprising a radically transferable azide group.

Woodworth does describe the polymerization of many monomers, stating that the first and second monomers are independently selected from vinyl monomers, allylic monomers, olefins, and mixtures thereof. This is an extremely large number of monomers and Woodworth does not specify which of these monomers would preferably be first monomers and which would preferably be second monomers. The vinyl monomers may include (meth)acrylic acid, (meth)acrylates, (meth)acrylamide, N- and N,N-disubstituted (meth)acrylimides, vinyl aromatic monomers, vinyl halides, and vinyl esters of carboxylic acids. *See* Woodworth column 9, lines 39-51. Admittedly, (meth)acrylic acid is an ionic monomer. Woodworth does not indicate whether the (meth)acrylic acid is preferably a first monomer or a second monomer. This is the only indication that an ionic monomer may be directly polymerized in this process. All other ionic substituants in the pigment dispersant are formed by post polymerization reactions. This is the emphasis of the patent. *See* Woodworth column 12, lines 1-12, lines 24-27, lines 45-50, lines 54-61, and column 13, lines 50-54. The disclosure of Woodworth contains a description of well over fifty monomers. There is

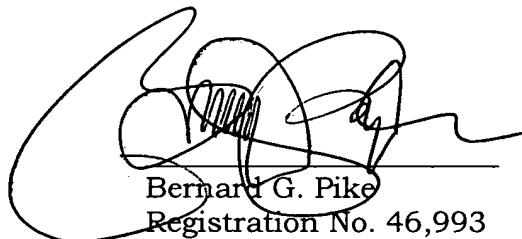
additional discussion of concerning the post polymerization conversion of these monomers to ionic species to form the hydrophilic backbone of the pigment dispersant. As noted above, the hydrophilic backbone is preferably prepared by a non-living polymerization process of second monomers. Since the backbone is hydrophilic, it would be understood that the (meth)acrylic acid would be a second monomer polymerized in an uncontrolled polymerization. There is no discussion or suggestion of polymerizing ionic monomers to directly produce a polymeric backbone or polymeric branch without post polymerization reaction.

The claims of the subject application are directed to a controlled polymerization process for (co)polymerization of radically polymerizable ionic monomers, comprising initiating the polymerization of free radically (co)polymerizable ionic monomers in the presence of a system initially comprising a transition metal complex and an initiator comprising a radically transferable azide group. This is a very specific initiator and monomer combination that is not suggested in Woodworth and that Woodworth does not motivate one to produce. The problem that results from the interaction of the catalyst and the ionic monomers in the controlled ATRP process were not discussed in the application. Reconsideration of the rejections is respectfully requested.

**CONCLUSION**

Applicants believe that they have fully addressed each basis for rejection under § 103(a). Reconsideration of the claims of the subject application and issuance of a Notice of Allowability is respectfully requested. Should the Examiner have any remaining concerns, he is requested to contact the undersigned at the telephone number below so that those concerns may be addressed without the necessity for issuing an additional Office Action.

Respectfully submitted,



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Bernard G. Pike  
Registration No. 46,993  
Attorney for Applicants

**Kirkpatrick & Lockhart Nicholson Graham LLP**  
Henry W. Oliver Building  
535 Smithfield Street  
Pittsburgh, PA 15222-2312  
Phone: (412) 355-8620  
Facsimile: (412) 355-6501

Customer No. 26285